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COOP'S COMMENT ON TECHNOLOGY

WHAT IS A FAIR RATE?

A recent communication from SPACE alerts the member-ship that CNN (Cable News Network) has reappraised its "rate structure" and determined that there shall be a minimum annual charge of \$75 for CNN service. SPACE makes the point that CNN charges individual cable connected homes either 20 cents or 25 cents per month; the difference being that the lower rate applies when the cable system also takes WTBS fulltime. SPACE feels the \$75 per year for a single home is discriminatory. They term the fee "...on the outrageous side... some thirty times the rate for a cable subscriber..."

I am not so sure I agree with SPACE on this one. Certainly \$75 a year for a single home is high, even for CNN's 24 hour per day coverage. Asking an "outrageous" fee is a good way to put people into the delicate position of having to evaluate the value they receive for their expenditure. Many people, faced with paying \$75 a year for CNN, or simply not paying and watching anyhow, are going to opt for the latter.

High single family rates are not new to our industry. Originally WTBS was available (for a brief period of time) at an annual single family rate of \$60. WGN followed suit. But too often the would be subscriber failed to read and digest the balance of the fine print in the "offering". This may be the case with SPACE's assessment of the CNN \$75 per year fee.

What CNN is saying is that their minimum fee per year is \$75. What WTBS originally said, what WGN says, is that their minimum fee is \$60 per year. Down in the fine print all of these people also note that the same minimum fee applies to more than a single connected home. In the case of WTBS and WGN, they were telling us that \$60 a year or \$5 a month (but paid annually) would pay for 1 home, or 50 homes. And any number in between. CNN is telling us the same thing; except the number is 30 homes, or any number between 1 and 30.

The problem here is largely semantics. I do not expect to walk into the Miami wholesale produce area and buy a **single** apple at the divided-by pricing that **50 bushels** would sell for.

The simple fact is that all satellite services "sold" are sold at wholesale rates. In bulk. Or they are given away, without charge. I can understand the argument that if you provide your own terminal, you (like the cable operator) should be able to buy at the wholesale rate. I can also understand the position of the seller who does not want 1,300 bulk buyers and 13,000 single unit buyers on his books. I am enough of a businessman to know that the office staff would have to increase dramatically just to keep tabs on the low-rate single unit buyers.

I certainly don't expect CNN (or anyone else) to establish me as a separate ledger line entry, keep track of my payment record, send me promotional literature and treat me like a "bulk" or "wholesale" buyer of hundreds or thousands of units of their service, when I am only paying for a **single unit**.

I see two possible solutions to this impass. SPACE should pursue both and see which one works. First, I encourage SPACE to negotiate with CNN (and others) so that the minimum fee (whatever it is) is not for "up to 30 subscriber units for a year', but rather, it is for "a single subscriber unit for 30 years". CNN doesn't want your ledger card popping up every month or year; fine, let them establish a simple "re-bill in 30 year" file. Neither you nor Ted Turner are likely to be still alive in 30 years, so who really cares. And, CNN will be a small line in a history book, if that. That lets them forget about you and by forgetting you (once having paid) you are no longer an entry line that requires regular office personnel time, or filing space. My alternate plan would be for SPACE to handle the subscriber files. They send CNN \$75 for a year and they then in turn sign up 30 private terminal operators who pay SPACE. Since SPACE is hurting for money, let them charge not 75 divided by 30, or \$2.50 per member per year, but rather \$5 per year for CNN. None of us would object to paying that fee for CNN, and in the process providing SPACE with much needed funding. If I were doing it, I'd arrange to pay CNN \$75 for "30 subscriber untis". Then I'd turn around and "sell" the same 30 subscriber units to a SPACE dealer. He would pay SPACE \$150 for the same 30 units, and he would either "gift" the subscriber with the CNN first year subscription, or he'd simply collect it (and other applicable fees) from the subscriber. I'd also insist that each such private terminal owner become a SPACE member, and I'd build into the low-end private terminal owner/operator membership category some amount of money to cover automatic viewing rights to a real package of "SPACE negotiated Viewing Services". If you packaged CNN, WGN, Nickelodeon, and WOR at \$5 each (\$20 total) with PT1, CBN, The Music Channel, and C-SPAN (all no charge) as a "SPACE Viewing Package", and offered these with a one year membership in SPACE for say \$50 a year, then the SPACE dealer would really have a nice package to sell and to help take the cloud off of "legal viewing". Best of all, SPACE would make money and gain instant stature with the programming crowd by becoming the focal point here.

So is \$75 a fair rate for CNN? Probably not. But kicking and screaming and yelling about discrimination is not the answer either. It's time to turn the lemon into lemon-aide.



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OOP'S SATELLITE DIGEST-

FOR LAUNCH OF F3R

A SECOND TRY

In December of 1979 RCA launched via NASA SATCOM F3. This bird was to be devoted exclusively to cable television programming and was (at the time) to rest in Clarke orbit at 132 degrees west. The launch into low orbit went off with no major hitches. However, once the low orbit trajectory was established the bird still had to be "hurled" out of low orbit into its Clarke/geo-stationary orbit. This is a little bit like twirling a rock about your head in a sling, as the Bible tells us David did to fell Goliath. At precisely the proper point in time and space the on board rockets are fired to "kick" the satellite out of low orbit and into an orbit that is higher and more nearly circular. David's rock was dead on target; RCA's was not. RCA F3 literally disappeared into space. And with it went all concrete evidence of what mal-function had occurred. Scientists and technicians, working with the recorded flight data up to the point of disappearance, were able to create several possible scenarios which individually would explain the lost satellite. Nearly two years have been spent, in the interim, building a new (replacement) satellite, and, second-guessing the failure with backup safety measures should it try to repeat again.

The loss of F3 will, in historical perspective, prove to be a turning point in US domestic satellite communications. Had F3 flown, on schedule, to target, the explosive growth and uncertainty which we now see with forthcoming Hughes, Southern Pacific, Westar (et al) birds would have taken a decidedly different turn. By losing F3, when they did, RCA provided a large hole in the sky which would be competition has scrambled to fill in. With F3, RCA had a "lock" on the cable industry business. Between F3 and F1, RCA was in a position to tie up most of the would be cable programmers. Without F3, on time, a gap has developed which now appears to guarantee us a much wider choice of satellite transponders in the mid'80s. As long as RCA dominated the cable and occasional video fields, in the sky, others (Hughes et al) were reluctant to enter the field. With RCA's loss of F3, a "timely opportunity" developed and with the onrush of new entrants into the field came encouragement for yet more would be programmers to have a go at national satellite networking.

There is that chance, of course, that F3R will also not fly. If that proves to be true, RCA is prepared with the launch of F4, approximately 60 days later, to back up F3R. When the original F3 flew, RCA had no on-ground spare (F3 was in fact originally intended to be a "spare" for F1 and F2). There is considerable amount of nervousness in the satellite industry these days over the launch of F3R and others that will quickly follow through 1982; the satellite insurance industry coughed

F3R UPDATE - The launch of F3R and F4 have been set back four to six weeks respectively due to problems with Delta launch vehicle. This would place F3R operational date around mid to late January; F4 to early March.

up more than \$70,000,000 to RCA after the loss of F3 and that loss promptly caused insurance rates to soar. The insurance people had been asking premiums equal to roughly ten percent of the insured loss value; or \$7,000,000 in the case of F3. They, in effect, "expected" to see every ninth bird launched, lost. F3 was the 9th US domestic satellite to go up. If the insurance folks are correct in their assumption that one-inevery-9 will fail, during launch, everyone hopes that the one to be lost in the "next group of 9" doesn't happen until well into the second set. If any of the next few to be launched (F3R, F4, W4, W5, in that sequence, over the next 12 months) are lost insurance premiums may well soar to the 25% (of insured value) region; putting a severe damper on the "economies" of space relay.

RCA then has a great deal riding on the successful launch of F3R. It not only needs F3 operating, to retrieve its slipping position with the cable TV industry; it also needs the prestige of a successful launch (of F3R and F4 right behind it) to maintain a viable position in the worldwide satellite market RCA birds, designed and built by RCA aerospace, are trying very hard to compete with larger bird suppliers such as Hughes and Ford.

The cable industry has as much or more riding on the success of F3R. Since the loss of F3, programming has been split over three or four birds. This has "fractionalized" the audience for many of the newer services, limiting their cable distribution to those systems with two or more dishes. RCA attempted to hold the cable crew together by working out a sub-leasing arrangement with AT&T for use of COMSTAR D2, after the failure of F3. A handful of services took the D2 interim arrangements; many more decided to "wait" or go elsewhere. Cable programming is also found on W1 and W3 these days.

Not The First Time

When F3R is launched, on station at **131** degrees west, and checked out to the satisfaction of RCA, a date will **then** be announced; a date on which all existing services on F1 will "pick up and move" from F1 to F3R. This is, as you might suspect, not an easy act to pull off.

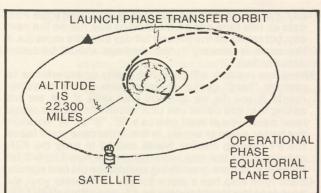
Back on June 1 of 1978 a similar event occurred. The cable television industry had, from the start of the first HBO service in the fall of 1976, been using RCA's F2 bird at 119 degrees west. RCA first loaded up the available horizontal transponders on F2, and then it began loading of vertical transponders. F2 was (and is) however largely devoted to Alaskan traffic and it does in fact have a special boresight beam for six of the transponders which favors Alaska, to the exclusion of service in the 'lower 48". When the cable programming 'load' exceeded the supply of transponders on F2, RCA notified everyone that they would have to move the services to F1.

In those days there are were fewer than 500 CATV terminals using F2, and, most of the uplinks were owned or controlled by RCA. As you can reason, not only must the receiving terminal antennas be re-directed to the new bird but the uplink terminals as well must be re-directed. The 1978 move from 119 west to 135 west was across a considerably larger chunk of sky than the forthcoming move. A number of the "early" CATV polar mounted antennas found much to the surprise of their owners that they did not "track" properly over the 119 to 135 span, and this left some CATV systems without service for a few days while they were cutting and welding on antenna support members.

Formal announcement of how each of the uplinked services will handle their part of the "move" will not be coming for many months yet. Still, the sequence followed during the June 1978 move, from F2 to F1, can give us some advance clue of what to expect, from whom, when.

All of which says that uncertainty is the

All of which says that uncertainty is the one continuing thread that runs through all that has happened, and is likely to continue to happen, for the next year or more. Each action provokes reactions and new programmer scenarios are crea-



IN GEO-STATIONARY ORBIT AROUND EARTH, IT IS ALWAYS ABOVE THE SAME POINT ON THE EARTH'S EQUATOR, THUS IT APPEARS TO BE STATIONARY IN THE SKY. SATELLITE IS TYPICALLY MAINTAINED AT ITS ORBITAL POSITION TO AN ACCURACY OF+/- 0.1 DEGREES OR LESS AS SEEN FROM THE EARTH.

ted weekly which further complicate the maturing of the service.

- 1)Shortly after RCA has F3R spotted at 131 west, they will begin the systematic checkout of each transponder. Remember that the bird is "flown" with telemetered data sent to the bird, and received from the bird just above 3700 and just below 4200 (MHz). This telemetered data is perceptible with a spectrum analyzer attached to a relatively large dish (16 foot up) but you cannot expect to see much from it with smaller antenna equipment. Telemetered data will be exchanged with the bird on a constant basis, even as it is being "flown" into position at 131 west.
- 2)Once "on station", F3R will be fed video signals from Vernon Valley (N.J.) and South Mountain (California). Each transponder will be checked for its full range of operational characteristics, to see if each survived "the flight" intact, While these checks are being run, a separate set of checks are run on the powering system (to insure the solar panels deployed properly and that the tracking mechanism is functional), control system and standby systems.

RCA suggests that a full flight "check-out" may require two months time. Towards the end of the check-out period, you may begin to see some of the CATV programming services pop up on their F3R assignments. With the check out complete, and assuming each transponder is found to be operational, a final transponder assignment "table" will then be announced and with it will come a target "change over date". That will be the day when those uplinks that do not have "dual bird feed capabilities" must physically move their own uplink antennas to the new F3R bird.

Those services which go to the bird, from an RCA facility (i.e. Showtime, for example through Vernon Valley), will start feeding programming on **both** F1 **and** F3R perhaps two weeks prior to the actual change over date. This is possible because RCA will have a massive uplink antenna fixed on the F3R bird from the very beginning of operations, and the baseband (video and audio) signals present "in facility" to feed such services to a pair of birds at the same time. Other services, such as PTL, will simply not appear on the new bird until they close down service on the old bird and move their uplink antenna.

When Do You Move?

Assuming that you do not have a motor driven antenna

ATTIENTION AFFLLATIES

As of 6:00AM editible morning all earth stations should reposition to Sateom 1 at 125 degrees W. longitude.

Transponder 24 East, & Cent. Transponder 22 Mt. & Pacific. Transponder 20 Spare.

HBO INSTRUCTIONS to all "affiliates" during the F2 to F1 move in 1978.

system so that you can monitor the day-to-day progress on F3R, seemingly the best day to "leave" F1 would be on the formal moving day. If the prior move from F2 to F1 is instructive, there will be plenty of "on screen" instruction, both on the moving day and probably for a week or more of the actual date. There is something to be said for moving your own terminal to the new bird a day **ahead** of "the pack", since watching the new services "pop up" and make their uplink antenna adjustments as they zero-in on the new bird is pretty educational. The system employed is actually pretty straight forward, although some of the uplink terminal operators get nervous and get things out of sequence.

- 1) First, they shut down the uplink transmitter on the old (F1) bird, and
- 2) Next, they swing the antenna (east) towards F3R while watching for signs fo the F3R signals on their 4 GHz feed (i.e. using the dish strictly as a downlink). When the new signal is found, and peaked for maximum level, then...
- 3)...they fire up the uplink transmitter to re-establish contact with the (new) bird.



SHOWTIME welcomed terminals to F1 with slide annoucement to alert their "affiliates" that they had "found the bird".

T4-10/81



SATELLITE DIGEST

Measuring The Signal

As an international group of observers/users of the present F1 signals and the new F3R signals, we have a unique ability which even RCA cannot duplicate. And what is that? As a group, we can plot within a matter of hours of the change over to F3R just how much better (or worse) the new bird is than the old (F1) bird. The importance of this data cannot be over stated, since it will build a foundation of information for tens of thousands of private and commercial earth terminals to be built in the future.

A special logging form appears here in this report. This form is to be used by you in recording the F1 signals just before the official change over day, and then, the F3R signals two days after the change over. Then the form is to be returned to CSD promptly so that we can create for publication in the Digest a comprehensive report of just what the changeover from F1 to F3R really meant, all over the North American continent.

The following guidelines are presented for completing the

reporting form:

1)We want to record the F1 levels, at each location, while all of the F1 transponders are still active. If the official changeover date is well publicized, via the bird or otherwise, we ask that you make these readings two full days prior to the moving day. If you start to get nervous about them yanking the signals out from under you, jot down the readings on a daily basis on a separate sheet of paper, updating them each day as you go along. In that way you'll have the last set of readings to transfer to the CSD reporting form.

2)The day of changeover is likely to be confused; perhaps even chaotic. And the next day is likely to be a "settling in"

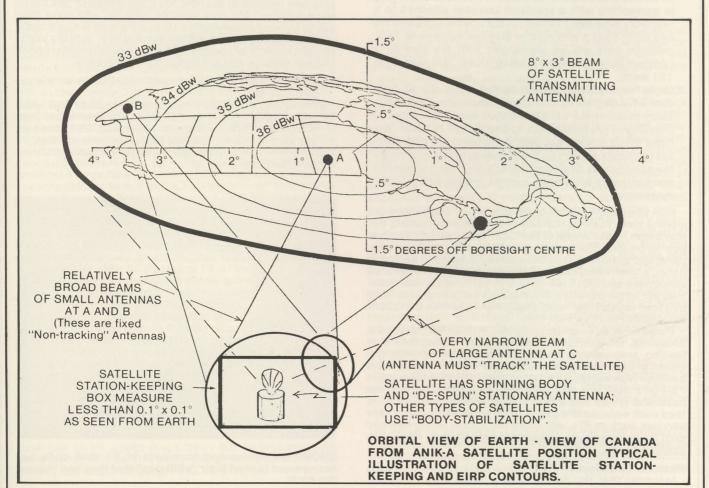
day. For this reason we ask that you complete the F3R data on this form not on the moving day, nor on the next day, but rather on the second full day after the move (i.e. if the move is January 1, the readings should be taken January 3rd).

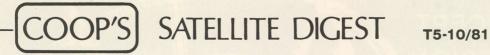
3)Very few readers will have the ability or experience to perform "hard" carrier to noise ratio (CNR) measurements. If you do, we applaud your data. If not, we are asking that you either use your receiver's relative signal level meter, you at least give us a "B", "S" or "W" notation (for better, same or worse). In this latter case you'll leave the F1 reading column blank and fill in only the F3R column, since the new readings on the new bird will be those that you are quantifying against the old bird signals.

4)Each form also has a place for you to indicate your six best looking transponders on F1, and alternately, F3R. This is purely subjective (i.e. eyeballing it), but it is very important data since it will allow us to analyze the boresight patterns for the F3R bird and to compare that data against the FCC filed boresight data.

What To Expect?

We now have sufficient experience with RCA birds to know that the best thing to "expect" is the unexpected. The F3R bird is very similar to the F1 and 2 birds now operating; according to RCA, the only substantial changes relate to four 8.5 watt transponders (out of 24), a standby 5 watt TWTA amplifier for each six transponder bank, and a ten percent increase in solar powering capability. We have seen nothing that suggests to us that RCA has re-designed their basic transmitting antenna configuration; i.e. the general "pattern" should be guite similar to that we now have with F1/F2.





COOP'S SATELLITE DIGEST F1 TO F3R COMPARISON ANALYSIS

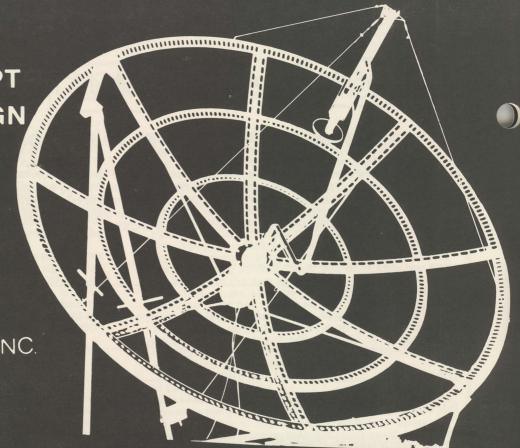
Instructions: As close to the actual "moving day" as possible, on F1, record your observations of F1 relative signal levels / quality at your location. Then starting with the "moving day" as day one, go forward three days and record the relative signal levels / quality for F3R at your location. Promptly return this form to CSD, P. O. Box G, Arcadia, Oklahoma 73007. North American maps showing changes in signal levels and quality will be prepared from data submitted and will appear in the first available issue of CSD.

own/City	State	Zip
Dish Sizefeet; Lf	NA Temperature	; Receiver Type
F1 Observations: Made at	ST on	, 198
F3R Observations: Made at	ST on	, 1981
F1 Observations	F3R Observations	Best Six Transponders
Trans. 1	Trans. 1	On F1:
Trans. 2	Trans. 2	
Trans. 3	Trans. 3	
Trans. 4	Trans. 4	On FOD:
Trans. 5	Trans. 5 Trans. 6	On F3R:
Trans. 6 Trans. 7	Trans. 7	
Trans. 8	Trans. 8	
Trans. 9	Trans. 9	
Trans. 10	Trans. 10	Notes:
Trans. 11	Trans. 11	
Trans. 12	Trans. 12	If you are capable of CNR measurement
Trans. 13	Trans. 13	please use that technique in reporting.
Trans. 14	Trans. 14	not, and you have a receiver with a relative
Trans. 15	Trans. 15	signal level meter, use actual meter rea
Trans. 16 Trans. 17	Trans. 16 Trans. 17	ings in reporting. If neither applies, use "(better), "S" (same) or "W" (worse) indication
Trans. 18	Trans. 18	on F3R only since your reference will be I
Trans. 19	Trans. 19	signals.
Trans. 20	Trans. 20	
Trans. 21	Trans. 21	If your receiver has a dual purpose meter (i
Trans. 22	Trans. 22	discriminator and signal level) be sure it is
Trans. 23	Trans. 23	signal mode!
Trans. 24	Trans. 24	

A UNIQUE CONCEPT IN ANTENNA DESIGN



COMMPLUS COMMUNICATIONS, INC.



RIGID AND LIGHTWEIGHT

LOW WIND RESISTANCE

EXACTING ACCURACY

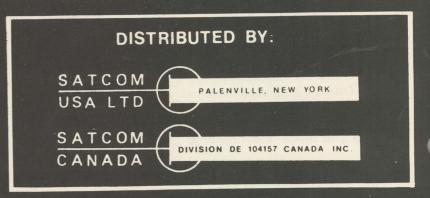
EASY ASSEMBLY
EASY SHIPPING
COMPLETE PACKAGE

EXPANDABLE

- 8 cast aluminum sections offer maximum strength / minimum weight. Total weight 325 lbs.
- High quality expanded aluminum reflector surface
- Cast aluminum sections ensure excellent production accuracy
- Two or three hours two persons
- Packs in a 7' x 5' x 3' crate
- Includes reflector, tracking polar mount, prime focus feed and L.N.A. rotator
- Additional bolt-on sections allow expansion to 15 feet

TECHNICAL SPECIFICATIONS

12 foot diameter
41 dB gain
1.5° Beamwidth (-3dB)
Prime Focus Feed
125 MPH Wind Survival
Tracking Polar Mount
25° — 60° Latitude
Look angles to 10°



Early on, RCA **did promise** that by re-directing the bore-sight slightly to the south and east they did **expect** to bring up signal levels in the southern portions of Florida by as much as 2 dB. This has always been a tricky area, where relatively low look angles plus reduced footprint levels create difficult reception conditions. That announcement has not been repeated since the loss of F3, however, and whether that is the intention of RCA with F3R remains to be seen. The fact is, in spite of the best intentions, the **real** service areas from F3R will not be known until we have the bird fully operational, and there are hundreds of detailed **CSD** reporting forms filled out and turned in for analysis. One thing we can look forward to however - an interesting week or two, and a whole new set of experiences as the cable industry's use of satellites moves into "phase three" of growth.

Also Ahead

The mid-October launch and successful deployment of F3R will be but the first of four "of-interest" launches in the coming 12 months or so. At the present time the launch of F4,

to 83 degrees west, is scheduled for December and it should become fully operational in March of 1982. F4, you will recall, is scheduled now to become the "CableNet 2" bird; to take over the traffic load from COMSTAR D2/(D1) and to allow additional new cable services to reach the nation's cable TV headends. Following closely on the heels of F4 will be the Western Union W4 bird, to be 24 channels, and to replace the present W1 bird at 99 degrees west. Launch is scheduled for February and operational in May of 1982. With the additional transponders available, W4 will become a significant "video bird" late in the spring. Later in 1982, November is a good guess now, Western Union will replace W2 at 123 degrees with another 24 channel bird (W5). It is on the combination of W4 and W5 that Westinghouse has "reserved" ten channels for video.

Thus the experience the industry gains wih the F3R replacement exercise will merely become the "proving grounds' for an entire new world of video to become available in the coming months. Who will be the first to receive a test transmission from the new F3R? We'll all know in a few months.

Figure 1 illustrates the test set up utilized. The Vidiark horn

COMPARISON OF SPHERICAL FEEDS

For my first TVRO system I managed to barter and trade technical services for most of the needed components, but alas, I was not able to come up with an antenna. So I parted with hard earned cash to acquire a slightly used Vidiark 12 foot Spherical reflector. I knew and understood the traditional parabolic antenna, but the Spherical was new to me. Having acquired the used 12 footer without a feed, I ordered the feed from Vidiark and proceeded to start studying available reference sources on the Spherical design.

Shortly after the horn arrived I had pictures. But, as is the case with most new self-done systems, they were pictures that could only be appreciated by the designer-builder. And after a few weeks of viewing even this designer-builder began to appreciate that the quality was not the best. Having already tweaked the reflector surface as closely as possible, the attention then turned to the feedhorn (system). It was about the this time I discovered an article in CSD discussing feedhorns for my type of reflector. I immediately scouted the local area to see if I could locate a Tristar Spherical feed. I did locate one, and at the same time I learned that Chaparral had a new proto-type Spherical feed as well. This, then, seemed like an opportunity to perform extensive tests between all three of the feeds designed for Spherical use: the standard horn, the Tristar feed and the Chaparral feed.

was used to establish a reference, against which the other two would be compared. The LNA was a Dexcel 120 degree, 50 dB gain, followed by 6 feet of RG-214, a DC power block, and a 3.7 to 4.2 GHz bandpass filter. This was followed by a Narda 0.1 dB step variable attenuator and finally a Gillaspie & Associates model 7500 receiver which has an excellent tracking field strength meter.

The reference (Vidiark) horn was installed and the highest signal strengths for both the vertical and horizontal polarized

The reference (Vidiark) horn was installed and the highest signal strengths for both the vertical and horizontal polarized signals on FI logged. Then the Tristar feed was put on in place of the reference horn and the variable attenuator was adjusted to return both of the logged reference signals back to the levels noted with the reference horn. This sequence was repeated three times to allow any signal variations, eyeball error averaging and other anomalies to "wash out". The same sequence was repeated for the Chaparral Spherical feed.

The whole sequence of installing each feed, making three descrete measurements on the strongest vertical and strongest horizontal transponders, was repeated **three** times on **three** different days. After each test of the Tristar and Chaparral feeds, the reference horn was re-installed to validate that the reference numbers were still good. The results were then simply averaged and are shown here as **table 1**.

TABLE ONE

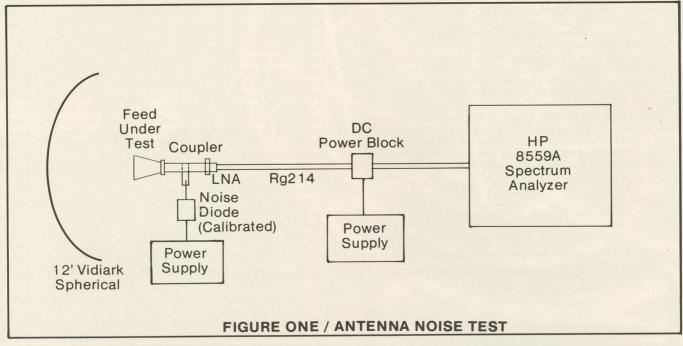
Polarity	Ref. Horn	Tristar	Chaparral
Vertical	0 dB	0 dB	+1.2 dB
Horizontal	0 dB	0 dB	+1.2 dB

As will be noted in table 1, no signal improvement could be measured with the Tristar Spherical feedhorn. The Chaparral feedhorn showed a 1.2 dB improvement over both of these feeds (*). From a purely subjective point of view, the quality of the picture with the Tristar looked identical to the reference horn. The Chaparral, however, improved the picture quality to the point that my wife asked when I would be moving the system from my lab into the living room. Progress at last! While I had possession of the Chaparral proto-type feed,

While I had possession of the Chaparral proto-type feed, Jack Trollman and I decided to measure the noise temperature of the Spherical antenna using both the standard horn and the Chaparral super feed. A separate report is being prepared on that subject (**).

* - CSD evaluated the Tristar Spherical feed earlier this year and found it to be +0.85 dB (average) "hotter" than the standard Vidiark feed. Our tests however are marred by what later turned out to be a badly warped Vidiark 12 foot antenna. Gustafson and Trollman are certainly capable

by M. L. Gustafson San Jose, CA 95110



of conducting proper A-B-C- tests and we have no quarrel with their methodology. We are interested in hearing from others who have done direct comparisons between the Tristar and the standard Vidiark horn since we have some difficulty accepting that the Tristar shows "no improvement" over a standard horn.

** - Spherical "noise temperatures" (the figure of merit for antenna rejection of unwanted earth noise) has long been a controversial subject. Most "wisdom" suggests that Spherical reflectors will exhibit a higher G/T (figure of merit) than a comparable sized parabolic reflector.

THOSE WHO DISPLAYED IN OMAHA

- ANIXTER-MARK 4711 Golf Road, Skokie, IL (312-298-9420) Total systems. Raymond J. Geraci, Carlyn Buchanan, Jerry Howard, Sigfried Alexeiew.
- ANTENNA DEVELOPMENT & MANUFACTURING, INC. P. O. Box 1178, Poplar Bluff, MO 63901 (314-785-5988) Total systems.
 James Gowen, Linda Gowen, Jerry Morgan, David Shumate, Linda Shumate.
- ANTENNA TECHNOLOGÝ CORP. 895 Central Florida Parkway, Orlando, FL 32809 (305-851-1112) Antennas. Eugene P. Augustin, Robert Mahaun, David DePue, Michael Oliver.
- ACTIVE SATELLITE MANUFACTURING P. 0. Box 544, Nisswa, MN 56468 (214-963-2261) Total systems. Stuart W. Smith, Kathy Smith, Don Walsh.
- ADVANCED ELECTRONICS, INC. 5085 S. Arville St., Las Vegas, NV 89118 (702-871-8766) Total systems. Jeff Stouffer, Janna Anderson, Howard L. Wilson.

- AVANTEK, INC. 3175 Bowers Ave., San Jose, CA 95051 (408-727-0700) LNA's, VTO's. Anne Monson, Barry Bakner, Dave Stogner.
- AVCOM OF VIRGINIA, INC. 500 Research Road, Richmond, VA 23235 (804-794-2539) Total systems. Andy Hatfield, Pat Hatfield, John McLean, Sandy Cottrell.
- COMTECH ANTENNA CORP. P. 0. Box 428, St. Cloud, FL 32769 (305-892-6111) Antennas. Glenn F. Higgins, George Birutis, Donald Sipes.
- COOP'S SATELLITE DIGEST P. O. Box G, Arcadia, OK 73007 (405-396-2574) Susan, Tasha, Kevin and Bob Cooper.
- DEEP SPACE COMMUNICATIONS, INC. Rt. 1, Box 351A, Chancellor, AL 36316 (205-393-3211) Total systems. Dave Braswell, Margaret Braswell, Jim Goodson, Frank Lambert.
- **DEXCEL, INC.** 2285-C Martin Avenue, Santa Clara, CA 95050 (408-727-9833) LNA's, receivers. Art Kawai, Yozo Satoda, Fred Graham.
- EARTH STATIONS, INC. Hwy. 22, Barling, AR 72923 (501-452-4391) Total systems. Bob Beaty, A. B. Richmond, Stanley Johnson.
 EARTH TERMINALS, INC. 255 Northland Blvd., Cincinnati, OH
- **EARTH TERMINALS, INC.** 255 Northland Blvd., Cincinnati, OH 45246 (513-772-6900) Receivers. William L. Gaible, James Jaegar, Clyde Washburn, Steve Corwin.
- ECHOSPHERE CORPORATION 5315 S. Broadway, Littleton, CO 80120 (303-797-3231) Total systems. Candy McAdam, Charlie Ergen, James DeFranco, Alan Beauchamp.
- EQUINOX SALES CORPORATION P. 0. Box 24374, Oakland, CA 94623 (415-893-0668) Total systems. Richard C. Hansen, R. Mason Truluck, Lou Kirby.
- GHOST FIGHTERS TV ANTENNA SPECIALISTS P. 0. Box 8136, Missoula, MT 59807 (406-543-4333) Antennas. Jim Anderson, Rick Trauth. Marion Nelson.
- GILLASPIE & ASSOCIATES, INC. 177 Webster Street, Suite A455, Monterey, CA 93940 (408-372-4771) Total systems. Norman Gillaspie, Werner Vavken, Lydia Gillaspie, Sheri Vavken, Ben Guill, Paul Byrnes
- GLOBAL TV ELECTRONICS, INC. P. 0. Box 219-R, Maitland, FL 32751 (305-628-2088) Total systems, Steve Reed, John Reed, Scott McNealus.



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- HAMILTON SATELLITE SYSTEMS, INC. 1101 E. Chestnut Street, Suite A, Santa Ana, CA 92701 (714-543-5217) Total systems. Gay M. Hamilton, James Matheson.
- HASTINGS ANTENNA CO. 847 West 1st, Hastings, NE 68901 (402-462-5565) Total systems. Dale Curtis, Paul Hohnstien, Will Jensbie, Harry Schartzkopf.
- H & R COMMUNICATIONS Route 3, Box 103-G, Pocahontas, AR 72455 (501-647-2291) Total systems. John Hastings, Jr., Virgil Richardson, Randy Thompson, Ann Hastings, Larry Poe, Robert Coleman, Lib Coleman,
- **HERO COMMUNICATIONS** 1783 West 32nd Place, Hialeah, FL 33012 (305-887-3203) Total systems. Robert Behar, Gary Willhoite, Estrella Behar, Yuri Delgado.
- HOOSIER ELECTRONICS INC. P. 0. Box 3300, Terre Haute, IN 47803 (812-238-1456) LNA's. Receivers. Steve Bland, Norman Bland, Jeff Vicars.
- INTERNATIONAL CRYSTAL MFG. CO., INC. 10 North Lee, Oklahoma City, OK 73102 (405-236-3741) Receivers. Royden Freeland, Charles Feverborn, Paul Denwalt.
- INDUSTRIAL SCIENTIFIC 5401 Del Rey, Las Vegas, NV 89102 (702-870-3373) Total systems. Paul V. Wells, Jackilene Dietrich, Donald Scheibel.
- INTERNATIONAL VIDEO COMMUNMICATIONS 4005 Landski, North Little Rock, AR 72204 (501-771-2800) Total systems. Gene Mullenex, Tom Hunt, Don Chastick.



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KLM ELECTRONICS, INC. - 1170025 Laurel Road, Morgan Hill, CA 95037 (408-779-7363) Total systems. Peter J. Dalton, David Barker, Grant Bright, Andy Anderson, Robert Dalton.

MA ELECTRONICS CANADA LTD. - 3135 Universal Drive, Mississauga, Ontario, Canada L4X2E7 (416-625-4605) LNA's. Brian C. Dins-

MCCULLOUGH SATELLITE SYSTEMS - Box 97, Salem, AR 72576 (501-895-3167) Total systems. H. D. McCullough, John McCullough,

MERRIMAC INDUSTRIES, INC. - 41 Fairfield Place, P. O. Box 986, West Caldwell, NJ 07006 (201-575-1300) Receivers, Power Splitters. Dan Loder, Dan S. Brodow.

MICROELECTRONICS TECHNOLOGY COMPANY - 2446 Watson Court, Palo Alto, CA 94303 (415-856-0300) Microcircuits. John Stover, Lou Dorren, Wally Resnick.

MICROSAT - Route 47, Washington Depot, CT 06794 (203-868-0503) Total systems. William Erbs, Harry Erbs, Millie Erbs.

MICROWAVE ASSOCIATES COMMUNICATIONS5 - 5803 Sovereign Road, Suite 206, Houston, TX 77036 (713-995-7070) Total systems. Tom Humphries, Charles Stanton, Pat Faris, Paul Fisher.

MICROWAVE GENERAL - 1100 A Lavenida Avenue, Mountain View, CA 94043 (415-969-3355) Total systems. Don Koijane, Chuck Colby, Frank



Foge, Andrew Koijane, Chris Kelly, Alicia Koijane, Carol Colby, Bob Shapiro, Connie Foge

MID AMERICA VIDEO - 324 Pershing Blvd., North Little Rock, AR 72204 (501-753-3555) Total systems. Lon Sheridan.

MID-CONTINENT EARTH STATIONS - P. O. Box 81673, Lincoln, NE 68501 (402-476-2211) Total systems. Rick Martin, Bob Lehr, Bob Martin.

NATIONAL MICROTECH, INC. - Hwy. 12 West, Grenada Plaza, Grenada, MS 38901 (800-647-6144) Total systems. David M. Fedric, Horton Townes, Joe Garner, Bill Ferguson, Martha Ray Fedric, Hollis Morrow, Guy Davis, Peter Chanky, Jim Rothbart, Dr. Robert Arn.

NEWTON ELECTRONICS, INC. - 2218 Old Middlefield Way, Suite 1, Mountain View, CA 94043 (408-224-2132) Satellite Signal Generators

PARADIGM MFG. INC. - 2962 Cascade Blvd., Redding, CA 96003 (916-275-6676) Antennas. David Johnson, Bill Marsh.

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63901 (314-686-4442) Total systems. Dennis Albright, John L. Hunt, Clif

R. L. DRAKE COMPANY - 540 Richard Street, Miamisburg, OH 45342 (513-866-2421) Total systems. Mike Brubaker, Steve Koogler, Merl Powell.



SATCOM CANADA / USA - 1140 Claire Cr., Lachine, Quebec, Canada H8S 1A1 (514-634-7177) Total systems. Rick Hebert, Chris Schultheiss, Mike Jurgenliemk, Dan Bernesi,

SATELLITE SUPPLIES, INC. - 164-B Gilman Avenue, Campbell, CA 95008 (408-370-1515) Receivers. Tom McArdle, Bob Bendorf.

SATELLITE TELEVISION TECHNOLOGY - P. O. Box G, Arcadia, OK 73007 (405-396-2574) Gloria Schneringer and Rodney and Dorothy Riddle.

SATFINDER SYSTEMS - 5146 South 94th E. Avenue, Tulsa, OK 74145 (918-664-4466) Total systems. Kay Feeback, Wilma Schindeler, David MacZura, Larry James, Jim MacKerelle.

SAT SHARE, INC. - 5301 Hollister, Houston, TX 77080 (713-460-9900) Total systems. Nelson Thibodeaux, Dan Cromwell, Ray Heinsohn, Wayne William,

SAT-TEC SYSTEMS DIV. RAMSEY ELECTRONICS INC. -2575 Baird Road, Penfield, NY 14526 (716-386-3950) Receivers. John Ramsey, Mike Leo.

SELECTVIEW & VALLEY PRODUCTS CORP. - P. 0. Box 668, Valley, NE 68064 (402-359-2556) Total systems, J. T. Daugherty, Jim Baber, Michele Schreck.

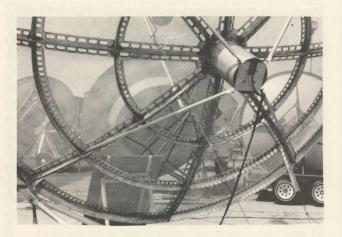
SATELINC - Riverside Drive, Chestertown, NY 12817 (518-494-4151) Total Systems. Eugene E. Lewis, Jason Minick, Ron Stewart, Nancy Lewis. S.P.A.C.E. - Craig Howard

SPACECOM - 860 West Riverdale Road, #D-8, Riverdale, UT 84402 (801-621-7950) Receivers. Royce Kruger, Mark C. Bates, Wayne Porter.

STAR TRAK SYSTEMS, INC. - 404 Arrawanna Street, Colorado Springs, CO 80909 (303-475-7050) Total systems. Robby Staver, Reg Dudley, Dave Miller.

STARVIEW OF TEXAS, INC. - 15304 Midway Road, Dallas, TX 75234 (214-934-9126) Total systems. James J. Redmond, Jeff Smiley, Stacy Petersen

STRATO VISION, INC. - P. O. Box 832, Jacksonville, AR 72076 (501-985-1589) Total systems. Bob Heinrich, John Lowry, Ron Morgan, Larry



TELECOM INDUSTRIES CORPORATION - 27 Bonaventura Drive, San Jose, CA 95134 (408-262-3100) Receivers. James G. Bertonis, Andrew Gibbs, Bob Broner.

TRANS-SAT CORP. - P. O. Box 14, Junction, TX 76849 (915-446-

2626) Antennas. Joe Burkholder, Randy Nolte, Jeannie Burkholder.

TV SATELLITE SYSTEMS, INC. - 49 Novner Drive, Cincinnati, OH 45215 (513-772-6565) Total systems. Howard Friedman.

UNIVERSAL SATELLITE SYSTEMS Div. of DOUG'S INC. -St Hilaire, MN 56754 (218-964-5604) Total systems. Doug Denhert, Paulette Dehnert, Richard C. Anderson.

UNR-ROHN - P. O. Box 2000, Peoria, IL 61656 (309-697-4400) Communication Towers. Lisa Rhodes, Mike Fleissner, Larry Grimes.

VAN'S ELECTRONICS - 1840 N. Tustin Avenue, Orange, CA 92665 (714-637-8030) Total systems. Dennis Vanderzyl, Rich Galvin.



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ARTB (Alexa Reportor) Television Servicio)—performing and cultural arts programming (6.8)

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CBN (Case News)—24 trivings years (6.8)

CBN (Case News)—45 trivings years (6.8) TR-19 TR-20 TR-21 Audio Services on SATCOM 1 SATELLITE RADIO NETWORK [6 2] WFMT[FM], Chcago [5 8 stereo] Seeburg's "LIFESTYLE" Music [7 6]

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VECTOR SYSTEMS, INC. - 519 E. Broadway, Newport, TN 37821 (615-623-4420) Antenna Mount Control System. Joseph I. Overholt, Jim Callahan, Gene Brannam. VIDEO PRODUCT NEWS - P. O. Box 2772, Palm Springs, CA 92263

(714-323-2000) Publications. Steve Tolin, Mike Murashho, Bill Kaprelian,

W.H.D. SATELLITE TV SALES & SERVICE - 860 Speedway Road, Roseburg, OR 97470 (503-679-6566) Receivers. Gary Denny, Zdenek Antoch, Danny Wilson

WILSON MICROWAVE SYSTEMS, INC. - 4286 S. Polaris Avenue, Las Vegas, NV 89103 (800-634-6898) Total systems. Jim Wilson, Jerry Flatt, Al Tamura.

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NO FREE LUNCH?

Where you stop to think about it, there is no free lunch. I am referencing your description of the so-called amazing and "magic" new system that might solve most of the problems associated with satellite signal distribution (see August 1981, page T3). Did you forget to mention the cost of the "slave converters"; with one needed at each home? This should open up a whole new industry for TV servicemen!

It occurs to me that I could put in a 20 channel satellite receiver system for the approximately \$15,000 you mention. I It would take a dish, LNA, down converter and 20 in expensive receivers. And 20 modulators for CATV channels. Now I would have something which the "subscriber" could use without having to employ a "slave converter" at each location. Selective security could be employed, if desired, on certain channels. Heaven forbid if I had to maintain 1,000 or more of those little black and white receivers! Also, the slave black and white units could probably be broken into by some enterprising electronic hobbiest and there goes the ball game; wholesale duplication!

The bottom line seems to be that it seems we should not rush into something. This industry is too blue sky already, without adding more. There is no "magic". When words like that are used in a report, I get suspicious; although I accept that there are probably some real break throughs in the SCDN system.

Al Braun Alaun Engineering Montrose, CA 91020

Although we question your math, your points are well taken. One of the "clever" things the SCDN system does is "transfer" a chunk of the initial capital expenditure for a shared system evenly to the users. It also transfers the cost of a major source of maintenance (the in home slave units) to the same users. That may not be all bad. "Magic",

on re-consideration, may have been a poorly chosen word. The real problem we had in writing about this originally is that we were shown exactly how it worked, and then sworn not to write about it. That left us having to "cook up" easily identifiable words that we thought everyone would understand, to describe the system best we could, without giving away the proprietary secrets. Some day, perhaps soon, we'll be freer to write in greater detail about how all of this came about. Our tentative title is "The Bobbsy Twins Buy A Jet Airplane".

DISH ELEVATION

I have been involved in satellite TV since the first SPTS in Oklahoma City. My installation required some very unique "engineering" since I have the problem of looking "over" neighboring homes to see F1 or any other bird to the southwest. Everything I looked at was going to be far too expensive, until one day I was driving down the road and spotted a construction crane (with boom) at work. I headed home and spent several hours on the telephone calling every contractor listed; and finally spotted a scrap 12 foot crane boom section. I bought it at scrap prices and that's what you see in the photo.

I have CSD from issue "one" and so far have not seen anyone with a problem like this one, solved. I also have a complete photo album showing the process I went through to get my dish onto the mount, and operational. Is there interest in an article describing it? Perhaps others, with similar problems, would profit from seeing it in print.

Ron Pasquinelli Portsmouth, Ohio

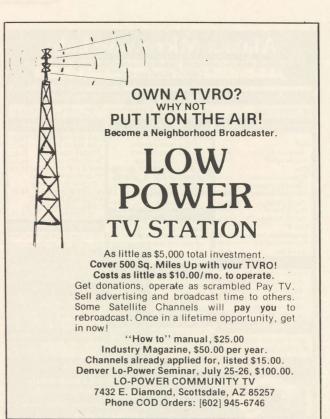


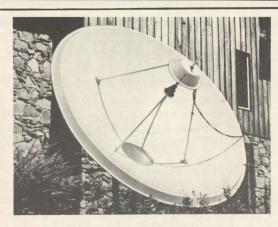
You bet! There's a chap in Amarillo who started working on a similar problem about a year ago, and another in Dubuque, Iowa who mounted his 10 foot SatFinder dish up on a post to clear his garage. Let's have your article Ron as we are sure the problem is much more common than printed reports to date would indicate.

BIRDS ON BOATS?

Myself and a few others on our ship are interested in the feasibility of getting a satellite TV receiver system operational on board a ship. Before we can present a solid request to the Command, however, we need more information on the equipment involved. Our ship is a destroyer and about half the crew have electronic related jobs. I'm the only one with formal television training however; limited to closed circuit applications. HAs anyone attempted this before?

John Stanley, IC2 USS Wm. V. Pratt (DDG-44) FPO Miami, 34092





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Marisat (navigational) satellites, also in geo-stationary orbit, are tracked with elaborate "floating platforms" that gyro-out (nullify) the effects of the ship tossing and twisting in the sea. Most of us have a difficult enough time finding a stationary bird from a stationary piece of ground; adding into the equation tracking a stationary bird from a moving platform would certainly be an interesting challenge. Anyone have any ideas on doing this; cheaply?

HOME BREW CASSEGRAIN

I could use a little help if someone who knows his antennas has a few minutes to spare. My TVRO station uses an 8 foot dish with a 3 foot prime focus giving an f/D ratio of .375. I have built it, however, as a cassegrain using a homebuilt classical hyperbola and a homebuilt feed horn. Right now my average picture is "almost" sparklie free. I think it can be better. My questions are these: (1) Has technology progressed to the point where I should be using a prime focus rather than a cassegrain feed? (2) Does someone (anyone) make accurate hyperbola reflectors for dishes? (3) Or, does somebody make a proper feed for my cassegrain fed hyperbola system? (4) Failing all of the above, where can I get good information on designing the proper quasi-hyperbola and associated feed horn? Finally, will the circular feed horns such as the Chapparal Super Feed improve reception when used with the cassegrain type antenna? I would be glad to pay a reasonable consulting fee for good answers, if somebody knows them.

Glenn E. Mysza 2007 Portsmouth Drive Richardson, TX 75081

If you are "almost" out of sparklies with an 8 footer in the Dallas area, you are doing something right! On paper, a properly designed cassegrain sub-reflector feed system should buy you perhaps 1.1 dB additional antenna efficlency. There is not much practical data available in literature we have seen on cassegrain sub reflectors and feeds, and we would welcome some knowledgeable reader spelling it out for all of us.

BIRD **OPERATIONAL** NOTES

F1 CHANGES - delays in equipment arrivals kept WGN from adding additional music sub-carriers on TR3, on schedule. Should be operating when this appears. WGN change to new microwave link for improved Chicago to Lake Geneva (uplink) about complete. CBN's use of sub-carriers for music and news services still not operational on TR8. USA Network being sold on TR9; will effect C-SPAN long term use. The Music Channel's stereo system, using subs of 6.2 and 6.8, requires special decoders for quality reproduction. Most receivers cannot handle multi-plex format without minor surgery. TR13, acquired by HBO in swap with Trinity, in semiregular use for HBO west, being dual-fed with TR22 service. When F3R flies, TR22 will no longer be used for western HBO service. TR15 cleared of audio, narrow band services, now in occasional video use for news feeds; primarily Seattle's KOMO and Portland's KATU in evening period, plus some sports. SPOTLIGHT, Times Mirror movie service, now 24 hours per day on TR19. SPOTLIGHT feeds audio (occasionally stereo, when movie is so encoded) on 5.8, 6.2 plus normal 6.8 MHz subs. Cleanest audio typically 5.8.

LOW POWER TV virtually shut down in US while FCC attempts to unsnarl mess created by flood of applicants. It is likely to be a year or two before anything substantial begins to happen here. A dublin, Ireland entrepreneur, meanwhile, has put a VHF TV transmitter on the air from a hoteleroom (!), showing videotaped movies and other (often US) specials. Legal battles are following, and the station continues to

ESPN's posture that it will not accept money for non-CATV viewers may have new problems; they are moving from "charging" to "paying" mode since their success is now bringing in lots of advertising. Keeping advertiser supported service out of public domain may be more difficult, legally, than keeping subscription service out of bounds.

GRAND OLD OPRY, using new ten meter uplink, may begin sending live programs to cable and TV stations very soon. Formal announcement of service expected this month; Westinghouse may become partner in venture, indicating Westar home eventually.

WARNER's The Music Channel could have competition soon; Heart Beat Music plans to announce a more adult (12 to 34 age bracket) music service this month.

NEW FLORIDA sports service should be on Westar 3, TR7 (13 on 24 channel receiver) 7 hours per evening when you see this. Southern Video Network, drawing from University of Florida, Florida State, three Florida based pro soccer teams, hopes to become first successful regional statellite delivered "ESPN" type service.

MORE DETAILS out for 1982 launch of Westinghouse/ ABC satellite delivered, cable news service. Each cable firm using service will have a pair of TVRO receivers. One will lock on the "national feed". The other will be electronically cut into servie on one of three "regioal" news service channels. For six minutes each hour, each system will receive customized regional service fitted into the master hour. There are 24 regions nationwide, typically cutting across state lines. The total of five transponders will be used in this manner. One will be dedicate to the national service, one will be dedicated to getting news reports back into the national network headquarters in Stamford, CT. Three will be used for regional feeds. Regional feeds will last six minutes each, and 8 of the six minute regional casts will be "stacked" on each of the three regional transponders. Advertising will fill the remaining 12 minutes per hour, per transponder. Between the three dedicated-regional transponders, 24 regional casts per hour will be transmitted. Regional uplinks will come from leading TV stations who are serving as regional "partners" in venture. Some of the early announced partners include Boston's WBZ, KYZ Philadelphia, WEWS Cleveland, WMC Memphis, WNEW New York and KPIX San Francisco. Service will begin on Westar 4; may move to Westar 5 later in 1982. Unlike CNN, cable firms will not be charged for service.

COLUMBIA will use 1/2 of Intelsat IVA transponder 24 to send television to San Andres Island in the Caribbean, and to Leticia City in the Amazonas. Some testing now being done

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of service on irregular basis on Global beam. A total of 16 antennas (8 meter size) are being installed for servie with scheduled completion around June 1982. When antennas are completed on ground, Intelsat bird will switch to **hemispheric** service providing 27 dBi signal into large region Northern South America and Caribbean. Hector Posada of Medellin reports reception of test transmissions, 3.5 to 4 dB above noise on homebrew 8.5 meter antenna.

(REPUBLIC OF) COLOMBIA also currently plans early '84 flight of SATCOL (Satellite Colombiano); a dedica to 4 GHz BS bird with two operating transponders, 38 dBw EIRP at boresight, 4.5 meter receive dishes (160 in all) spread throughout the country. SATCOL has space reserved on US Shuttle for launch of pair of birds.

CNN-2 will be new WESTAR III service offered by Ted Turner, free to cable firms, on January 1st. Turner wants to beat ABC/Westinghouse to operation, says CNN-2 will be mostly hard hitting, action news (few or no features like CNN now has) in 30 mintues repeat/updated segments. Transponder will be 11 (21 on 24 channel receiver). Service will be advertiser supported; CNN radio network also in planning stages, for satellite delivery.

CBS Cable, due on Westar 3 the 12th of this month (TR6; 11 on 24 channel receiver) will have dual audio feeds; 5.8 MHz will be in "stereo" (using normal FM broadcast techniques) while 6.8 MHz will be monoaural.

ESCAPADE, adult service on COMSTAR, has new partner, PLAYBOY Enterprises. New "marriage" will bring substantial new "original adult programming" to channel starting in January.

HUGHES Galaxie 1 satellite, due for 1983 launch, has additional takers; Ted Turner has purchased a pair of transponders, Westinghouse four. TIME, Inc. previously signed up for six.

ANOTHER new service due to start on F1 this month; 19th to be exact. Daytimes, on TR21, "The Preview Channel" will provide members of creative community with opportunity to "show off" pilot films, TV series. Operating hours 11:30 AM to 3 PM.

RCA's Satcom 66 (5th in series) would "like" to be operational by November 1983. FCC must pass on this one as RCA requesting location east of previous "North American window", and satellite would exceed number previously approved for RCA.

PARAMOUNT reports success with Westar program of sending out clips, promos and trailers of yet-to-be-released movies to theaters nationwide. Formal regular service, said to be cheaper than ground or air transportation, will expand and grow.

WESTAR 6 now has FCC approval. New 24 transponder bird expected to launch late 1983; no parking spot yet found. Western Union says "when it is time, there will be a spot...".

RCA had always intended Satcom 5 to be an Alaskan bird; now it is formal. (RCA) Alascom has purchased use of 14 transponders, (same as F2 at 119), for V's location at 143 west. What about the "other" 10 transponders? RCA suggests cable "could" get some.

CBN. Remember them? On F1 TR8? Well, take another look. CBN is rapidly becoming a national "secular" TV network, with soaps, variety, news and Saturday morning kid's shows. CBN is into nearly 12,000,000 US cable homes, second only to WTBS. Founder Pat Robertson is drawing his sites on becoming a true national fourth network.

RUSSIAN Molniya newscast, directly off of satellite (apparently) slipped into NBC Burbank news feed from Los Angeles to New York September 10th of F2 TR8. In a special, Jack Perkins reports on artificial hearts, being fed to New York, somebody punched up wrong video source. Not once, but twice. Insert lasted only seconds but veteran Russian TV watchers instantly recognized Moscow announcer. Feed was in full color, no audio. Apparently NBC now has a Molniya tracking staiton operational, in or near Burbank!

OUR COVER-

Perhaps you are not aware how "young" this revolution really is. That's a rare collector's item you see; an "invitation", issued by Scientific Atlanta, to attend the first HBO transmission-via-satellite to affiliates (both of them!) just six years ago. Anyone remember what the first program transmission was?

LATE MAGAZINE - Hurricanes Floyd and Gert are responsible for late October CSD; the first late issue in two years of publishing. Sorry about this!

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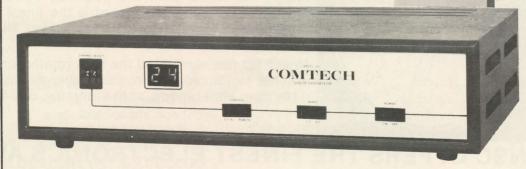
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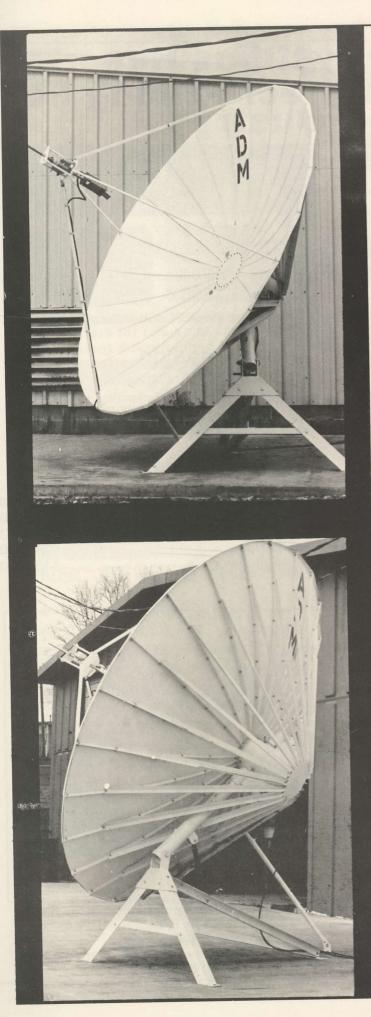
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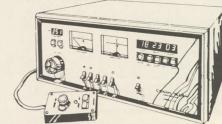
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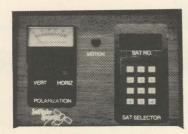


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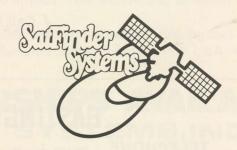
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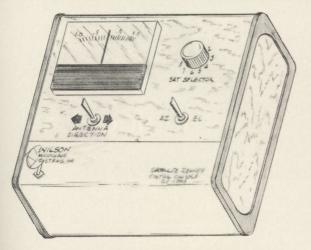
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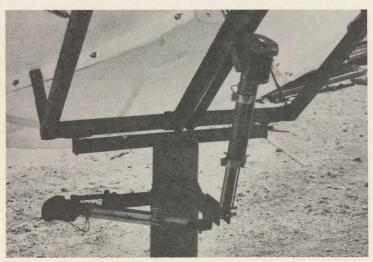
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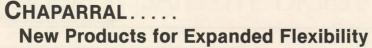
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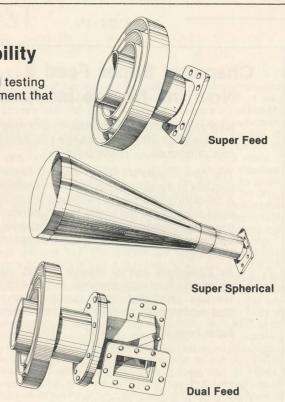
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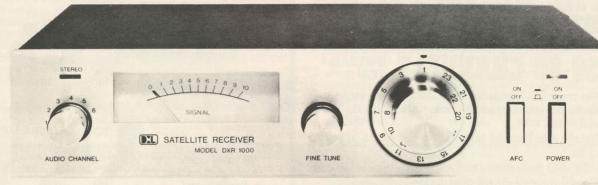
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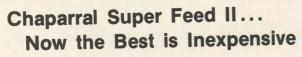
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COOP'S COMMENT ON PROGRAMMING

NETWORK JUNKIES

When the Coopers settled in the Turks and Caicos Islands, just over one year ago, and it became clear that we were going to be the creators of a new, first-time national television service, I did a fair amount of thinking about what type of programming I would pump through our network. I decided early on, having seen what a tremendous hold US networks have on television viewing "habits", that we would not make the same mistake. I artfully arranged our daily schedule so that every evening at 8 PM we have a movie. From someplace. A fair amount are off of tape, even today. "Facts of Life", "Trapper John" and that ilk do not end up on WIV-TV.

Now over in Grand Turk, our capital island and one where we will not be operating until mid-fall at the earliest, there is a two year old five watt VHF station that is fed programs from the states. A group in Tampa videotapes all of the local TV fare and sends it down to Grand Turk weekly on 1/2 inch. The Grand Turk TV "station" operator, using equipment left behind by a US Navy group that used to house a base there, cranks out around 8 hours a day worth for \$15 a month. The stateside programs are mostly network stuff, although they do include last week's newscasts from the local Tampa station. People on Grand Turk know what "Dallas" is. They also know we don't carry it here, and I've had to explain as tactfully as I can why we will not carry network programs down here (news and sports, live via satellite being the obvious exception).

Nobody, yet, has a **choice** between the two approaches to programming. It will be a couple of months before we have a "head to head" competitive situation. I am looking forward to it. I think a skillfully selected "indie" can run circles around a network. Very few would agree with me, so we have a test tube about to hatch down here in the outback of the Caribbean.

Now one of the very minor projects Kevin and I have been sifting to the back burner, for some months, is an MATV

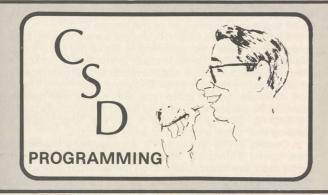
system for our Annex and house. I scouted up reasonably good quality modulators for channels 2, 4, 6, 7, 9, 11 and 13 and proceeded, with Kevin's help, to wire up a 20 outlet MATV system in the two buildings. Since we have no fewer than six satellite receivers running fulltime, it seemed a shame not to "loop" their signals outside of the TV network control room and into MATV outlets here where we live and work. Just because the **rest** of the country has a **single channel** of television is no reason **we** have to be limited to a single offering. Kevin talked me into this early, when he and his sister would frequently disagree with my 8 PM movie choice, and go off to a corner of the annex with their own VCR to watch some movie out of our extensive tape library rather than watch what the rest of the country was watching.

After we got the Bob Behar six meter Hero motorized antenna opeating in late July, Kevin found the AFSN stuff on vertical transponder 9, RCA's F2. That's the American Forces Satellite Network which beams US programs to Guantanamo Bay (Cuba), Roosevelt Roads (Puerto Rico), a US base in Panama and several bases in Alaska's outback. They offer around 18 hours per day of US CBS, NBC, and ABC stuff for our far flung service people. I was up to my neck working on copy for the new Coop's Basic Manual when he burst into the room to announce that he was going to watch "Different Strokes", "Charlie's Angels" and a long list of other US network pap the next day. What he found was that if you allow for the five or six hour time difference, AFSN was sending US network stuff out daily. With the VCR in his room he simply set it to start recording the AFSN feed, through the house MATV system, at 1 AM local time; when it was 7 or 8 PM in Alaska. Then the next morning he got up and reviewed what he "caught" while he slept.

Now, most evenings, while the rest of **our country** is watching the 8 PM movie I have selected for them, my family is curled up watching a tape of the previous nights AFSN feed. And loving every minute of "Dallas", or whatever. I have sworn each of them to secrecy; they have promised to keep it to themselves that we have this stuff available!

Naturally I can rationalize that my own family, after more than a decade of being exposed to US network programs, is hooked for life. That there is no saving them from themselves. But what about the residents of Grand Turk? What will happen when we get the last of the six WIV-TV transmitters installed, there, and they have a choice between my fantastic programming live via satellite, and last weeks or the week before's US stuff on videotape?

As strange as it sounds, I hate to see people "get hooked on television". I figure you can miss a movie or a specal, and not feel withdrawal symptoms for life. We all know what happens when a "Dallas" fan misses an episode of **their** favorite evening soap. I deliberately created a program schedule here that people could take, or leave alone, and not feel abdicted to, or a slave to. Maybe I am morally right, but way off base as a marketeer. We'll see this fall.



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OOP'S SATELLITE DIGEST-

SIX METER HERO IS NO TOY

SUPER 'TENNA?

I am going to preface this report in an unorthodox way. Bob Behar is my friend. Mi amigo. I want you to know this up front since I am writing about how well his six meter "Super Tenna" works for us down here in the outback of the Turks and Caicos. And I hope, sincerely, that Bob is still "mi amigo" after this report appears in print.

The Super Tenna is a mesh grid surface antenna available on the marketplace in 12, 16 and 20 foot apertures. Bob Behar operates Hero Communications out of Hialeah, Florida; a largely Spanish (Cuban) speaking suburb just east of Miami proper. Bob and Estrella and Ricky and Raina (the family) function largely in a Spanish speaking environment. The Coopers speak precious little Spanish (although we are learning), but our Kevin and Tasha would rather spend time with Ricky and Raina than anyone else they know. Those who saw our crew in Omaha probably recall the tireless three-some and foursome.

The Super Tenna came out of Bob Behar's decision, way back in 1978, to become part of the home terminal industry. There was no industry then; Bob's back yard antenna (a ten foot dish from Anixter Mark started it all) was perhaps one of the first 25 or so in the country, in a backyard. Bob's background is television engineering. His office includes awards for creative videotape editing, featuring commendation from CBS for creating a unique (and now standard) tool that allowed (at the time) innovative playback of professional football action on the Sunday pro telecasts you see on CBS. Bob is no slouch.

Bob Behar has a natural ability to get people's attention. Many of his "tricks" are legendary in the industry. He was the first, to our knowledge, to "exploit" public (no charge) display of major closed circuit fights. He simply set up some big screen units in front of his Hialeah store front and announced anyone who wanted to watch the fight could stop by. One of these "tricks" created a crowd of more than 4,000 people. Another one created such a crowd that the Hialeah police moved in and shut it down; anyone who couldn't fit indoors was told to "move on". Several thousand mad fight fans were turned away from that one. Bob learned something about getting "crowd/meeting permits" on that one. Bob also made lots of publicity mileage out of receiving the 1980 summer Russian Olympics from Ghorizont. He made every US network newscast, front pages of newspapers coast to coast and appeard on BBC-TV and other far away places over that one. One day the Brasilian national television service wanted to visit his facility; to do a story on his Russian reception. When the producer arrived Bob casually dialed up the Intelsat feed of Brasilian national TV and the astounded producer fell all over himself watching Brasilian TV in the US. Needless to say the producer changed his whole "story approach" over that one. Watching his own interview, coming back off of Intelsat's Brasilian feed, was one of Bob's prouder moments.

What does any of this have to do with the Super 'Tenna? Well, it tells you something about the man; this Bob Behar. He is a gambler. A man who says "Hey-let's try it and see If it works". Anyone who has seen him work, at shows or elsewhere, knows that he is quick on his feet, has a brilliant mind, and is probably several steps ahead of you at any given moment. I think that, combined with his Cuban background, makes many people who set out to deal with Hero nervous. I hate to say it, but some people simply do not appreciate the industrious nature of a hard working Cuban electronics whiz. I think the bad press that Cuban refugees have gotten on national TV may have something to do with that. That's too bad for those who have those kind of built-in biases; they are missing knowing, and appreciating, one of the really innovative minds in our industry today.

Having said that, I'd like to tell you about my Hero Super Tenna. It is a six meter unit. And it is motorized. It is also a proto-type unit. I think it may have been the second one ever built but I am not sure of that. The first one sits in front of Hero's place of business in Hialeah, cranking out fine looking

"I think you should have a six meter motorized antenna"
Bob mentioned one day. We agreed. "I have an advanced proto-type in the warehouse, one I won't sell because it is not as pretty as the production models, and we can probably make a good arrangement on it". I needed a "good arrangement" if I was going to air freight it down to the Turks and Caicos and wrestle it together.

Our orbit belt down here is filled with birds. It may be hard to believe for you who live in Iowa, but the footprint (signal level) down here from Russian's Ghorizont is stronger than the footprint from F1. We even have the SECAM color monitor in house so we don't have to watch European TV in black and white. Our sky is filled with birds, from horizon to horizon. Anyone, down here, who doesn't have a way to track through the orbit belt looking for or at "pictures" is really missing plenty of the real action. We wanted to do this, but we also wanted to have as high quality pictures as we could manage. We had looked at the AFC 7 meter antenna, and a proto-type tracking unit they have available. And at the new S-A motorized seven meter, which would have set us back a paltry \$35,000 plus freight. But the S-A unit can only cover around 100 degrees of the orbit belt and if we were going to go "that far' (as to motorize a big dish) we wanted to see from "edge to edge".

Getting stuff down here is a pain. You can ship by boat, fairly cheaply, but in the process you run the real risk that what you ship will end up broken or bent. We have a six meter Paraframe sitting out in the yard that came down by boat. We may never get it running, after they dropped half of it 60 feet to the ground with a crane. The Hero six meter ships to funny places like Provo on an airplane. Well, a DC-6 anyhow. Our "advanced prototype" arrived here in bundles. With no instructions. We don't fault Robert for that; we had taken dozens of photos of the unit in front of his shop and by carefully studying the photos in our files we should have been capable of making all of the pieces fit.

It didn't take us too long to figure out we were going to have to do some frame strengthening to make the mount strong enough. The Super'Tenna is chain driven by a ¼ horsepower electric motor. The chain and the motor are far overrated; you could probably move a small destroyer with them. The support structure, on our proto-type, was not as well designed, however, so we spent a couple of days rounding up a portable welding rig, getting it moved to our site, and cutting and welding into place a couple of extra supports.

In Omaha, at the recent SPTS, we watched a trained Hero crew spend perhaps 6 hours getting the five meter they displayed there assembled and on the mount. It took us a little longer since none of us had ever done it before. It took us just over six days, to be exact. Part of this was due to our lacking

prior experience, part because we had to build a "crane" to lift the various sub-assemblies into place using 4 x 4 posts and hand "come-alongs". In all honesty, putting together our particular six meter proto-type was not one of the enjoyable periods of my life. We made several (in retrospect) dumb mistakes as we went along that, when caught, required us to back track and do some steps over again. Our caution here is that even if you have assembled many antennas before (we have), each antenna has its own unique method of assembly. This is especially true with an "erector set" approach such as employed by Hero. The real caution is that you must build the surface so that when you get done you have a parabolic shape. Hero provides a "template" so that you can check it as you go along. The template mounts to the center of the dish and rotates around the full inner surface area as you go along. Each of the struts on the 20 footer has three separate pivoting joints, which must individually be adjusted for the parabolic curve for that particular strut. On a 20 foot dish, this is not overkill (although we thought it might be at first). Adjusting the dish "to curve" proved to be one of the less complicated and time consuming parts of the assembly. Seeing each strut "proof in" was, in fact, a pleasant exercise since even though the surface was not on at this point we knew we were "home free" as each did in fact proof.

Now it would probably be nice not to have to be concerned about getting each strut (there are 24 in all) "proofed". But, when you are dealing with a big surface area (a 20 foot has four times the surface area of a 10 footer), the alternate to putting it together on site is to buy an antenna in pre "cast" sections and then fight the battle of transporting large, heavy pieces. With the sectional or piece-by-piece approach, you still have a surface to put on after assembly of the super

structure.

The surface on all Hero antenna is a mesh. It is calculated that the metallic surface remaining is 58% of what you would have with a solid surface. Is there a penalty with a mesh surface dish? The answer is mixed. Two factors are working against you with any non pre-cast surface:

1)The final accuracy of the sections of the surface;

2)The final accuracy of the full surface.

The two are not necessarily synonymous. It is possible to have good **section accuracy** but poor full dish accuracy. Section dishes suffer this trait. An erector set antenna can suffer from both problems but one of the advantages of an erector set approach is that with a good template you can

usually bring the surface into "proof".

The "surface" you are proofing, however, can be the struts that support the actual surface and not the actual surface itself (the mesh). This presents a new challenge to proofing since once you have proofed the struts (without a surface) you then go to work to put the surface into place. We elected to proof the struts first, and then as we laid in the pre-cut mesh pieces re-proof each section as the mesh wedges were laid in place and fastened down. In the real world, surfacing a 20 foot aperture with mesh is a heck of a chore. Hero's people make it look fairly easy at shows; I can tell you that when you have never done it before, and the wind is blowing, and your helpers are working up to 20 feet or so above ground hanging like circus performers from the strut super structure, it turns into a slow and difficult task. Although our prototype had been previously erected (and dis-assembled), and therefore had pre-drilled holes for the metal screws that hold the surface wedges in place, the wedges we received were not numbered. There being 24 such wedges, the chances of locating the right wedge for the right (i.e. former) location was thin indeed. We spent an hour trying to match them up with the holes and then decided we would "simply" re-drill as we went along. I don't think that was a bad decision, even now, but it added an extra day - plus to the construction time.

The Hero mesh is stout stuff; a 200 pound man can walk on it when suspended between a pair of struts. You are not advised to do so however since you will probably indent it so that that section will never again take proper form. But with 24

sections, each of which is essentially 'flat" from strut to strut, you are not really building a true parabolic; you are building a 24 section series of pie shaped wedges which end up being "more or less" parabolic in **combined** shape. This is one fo the dis-advantages to **any** sectionalized dish that uses materials which do not have a built-in parabolic curve in each wedge section. The "sum" of the full surface is close to a parabola, but the individual pieces are simply flat pieces. You give away some gain when you do it this way.

Given that we spent too long putting it together (because we had no literature to help us, were working without proper tools and it was hot as you know what), the antenna went together with no serious problems. Valentine Pratt did or



SURFACING - we did a really dumb thing with the surfacing; we started putting it on before we ran the outside strut-end pieces around the perimeter of the dish. So we had to back track, and add them to the dish after the surfacing was begun. They made a big difference in holding the integrity of the curve to the template as we surfaced the dish!

oversaw most of the effort. Each day his optimism was new. "We'll get it, Bob" he kept saying. We did.

We elected to erect the antenna with the "nose down". This is something I understand the present buyers of the 20 foot will not have to contend with, since the whole mounting system has been changed. Our mount, with antenna attached, looks a little bit like a surealistic giant Praying Mantis perched and ready to pounce. The present mount is a single post affair and that, frankly, will cut way down on construction time. With the nose "down", we put the whole strut and surface together. Then using a hand built "crane" we jacked and lifted and tugged and pulled until we had the nose "up" and the antenna



SATELLITE DIGEST-

more or less into its proper elevation position. We built the concrete foundation for the dish up above the ground level, and placed it on a 12 foot by 12 foot concrete pad. The pad is overkill; we had two reasons for doing it this way:

1)We don't want the antenna to blow away in a hurricane

(something we have yet to test); and,

2) We were trying to cover up a previous disaster. The disaster was a 12 foot Vidiark Spherical which was run down last Fall by a slightly crazed D8 cat driver who lost his way while plowing our driveway, and ended up backing into (and crushing) the Vidiark shortly after it was completed. After removing the remains of the Vidiark we elected to build a large pad over the pillars we had poured for the Vidiark's support.

With two other antennas already in and operating (AFC 5 meter and SatFinder 3 meter) we figured we had a good fix on "north". The Hero is a polar mount, and you align the rotating axis of the huge support assembly with true north and south. After the nose was "up" we trotted out our ICM 4200 antenna alignment receiver, and a monitor, and went to work. The antenna was parked, manually, almost as far east as it could go. We had not attached the motor and chain drive at that point and while that was being done I inter-connected the electronics and turned on the receiver. No harm in spinning through the dial I thought.

There, on transponder position 9 was a bunch of guys playing basketbal. And a pretty decent picture at that. Humm. Now the antenna was pointed in no place in particular. Just "east". The transponder 9 plus eastern heading plus 7.5 MHz audio sub-carrier was a dead give away. We had by dumb luck, turned the system on with the antenna fixed on Ghorizont 2. The transmission was a US versus Russia summer basketball

tournament from Moscow. Things were looking up!

That was the last television we saw for nearly 24 hours. I reasoned (incorrectly, it turned out) that we had hit (precisely) the north-south alignment with the mount. The mount was temporarily secured to the huge pad with a pair of 3/8" lag bolts. We had one at the nose, around which we could do some pivoting, and another at the rear to anchor the beast down. After finding the Russian signal so quickly we proceede to bring the dish on to the west with the motor driven chain drive. As we ran through the North American domestic belt we saw zilch. Nothing at all. Back to Ghorizont, and, it was still there. So was (on close inspection) a sign of Intelsat at 24.5 degrees west location. Once again I made a faulty judgement call. "If the dish was close to being on for Ghorizont at 14 west, and it still was close to being on for Intelsat at 24.5 degrees west, it should be fairly close to being on for the opposite end of the belt". In other words, the Anik-B to F1 region. But, alas, it was not. No sign of any signals from North America.

At about this point in time Bob Behar was headed for Provo to bring us another proto-type; the first of his "Satellite Seeker" antenna remote control boxes. The pre "Satellite Seeker" control box for the Hero dish's motorized system was a simple "left" and "right" or east-west switch. The new control system allows you to have both full manual control (east or west), and, to also pre-set and then tell the dish to find any of up to 20 bird locations. By memory, on command. Behar arrived just in time to help us locate the problem with our polar alignment.

Now with a dish this size, when you are not properly aligned north and south, a number of "strange" things can happen. You have two adjustments to make; three actually. One, and



the most obvious, is alignment of north and south. The next, and second most obvious, is the proper elevation angle. The third, and least obvious, is the "declination offset" which is sort of a "fudge factor" built into the elevation system to allow you to track a non-perfect circle in the sky; the geostationary/ Clarke belt.

Valentine, Peter and I had argued for a full day about north and south. We took bearings on the AFC and SatFinder dishes, used a compass, used a surveyor's transit and I even went out after dark and re-sighted the north star. I should have listened to Valentine and Peter; their "native" intelligence was closer than my transit and compass wisdom. We allowed Bob Behar to arbitrate it for us and it took him about an hour to agree with my helpers. I had been off, by a whopping six or seven degrees, all along. Who says you can't teach an old dog new tricks!

Once we had the dish aligned north and south the real fun began. Most of the birds dropped in where they should. Ghorizont on the eastern edge was now so strong that it was perfect even on the Russian version of color bars. F1, the opposite end of the track, looked pretty decent as well. But some of the middle birds (Westar, Anik-B) were not what I calculated they should be. So we messed with the declination fudge factor and after an hour of fooling around (an antenna this big has big everything, including nuts and bolts; you don't



adjust anything without an effort), we had it locked in. Well, almost. We'll talk about ANIK B separately.

With the array tracking, Behar was anxious to try out his new control box. The proto-type we received had 12 positions on it (I am beginning to feel like everything we have down here is a proto-type of something!). It took Bob perhaps 15 minutes to make a simple screw driver (pot) adjustment for each of the 12 positions. He was like a kid in a candy store; each time he set the pot for one bird, he forced the machine to run back through all of the previous set positions. The "Satellite Seeker" control box is a good one. There is a digital read out that tells you where the dish is, to within .1 degree. And each time he returned to a pre-set bird it came directly back to that position and stopped. I never really cared for the previous east and west switch situation, since without a readout you never really knew where you were, unless you got very adept at ticking off birds as they flitted by on the screen.

Now the concept of moving six meters of antenna through the air, albeit it around a fixed (mount), is all well and good. The reality of it is that you are moving one heck of a big sail around and there are forces and stresses and momentum moving out there which you really have to be concerned with. The 1/4 HP motor that pulls on the heavy chain drive for the Hero six meter is more than capable, with the gear reductions em-

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SATELLITE DIGEST-

ployed, of moving a multi-tonned dead weight about. It is also capable of destroying itself. That is, if the motor was to run amuck (as in run to the end and then not shut down), the motor plus chain would (could, will) drive the antenna super structure (struts) straight into the frame. The super structure would buckle before the frame would give or the motor would shut down. And that plainly worries me since we had a near disaster of this sort not once but twice in the first few weeks of use.

The first time we had a problem was when the chain slipped out of its guide trough. That allowed the chain to pull out of the gear drive, and at that instant the dish was free wheeling. It was (thank God) almost to the eastern edge of the travel when this happened and the dish "fell" only a foot or so before it crunched into the frame. No damage to the dish or frame, but it probably took six months off my lingering years. This was our fault; not the chain's. You have to be very careful when you adjust the tension on the chain, to insure that the chain tension is balanced. Too much torque on the west half of travel and the east half develops slack. And vice versa. Too much slack, and, well...the chain could slip out of the trough, thereby falling out of the gear drives. We fixed this possibility by being extra careful with the initial tension adjustment, and by placing some straps over the trough so that should the chain ever try to slip out in the future it cannot leave the guide trough. Again, we don't fault Hero for this; although some extra safety bars to insure the chain cannot leave the trough does seem like a good idea.

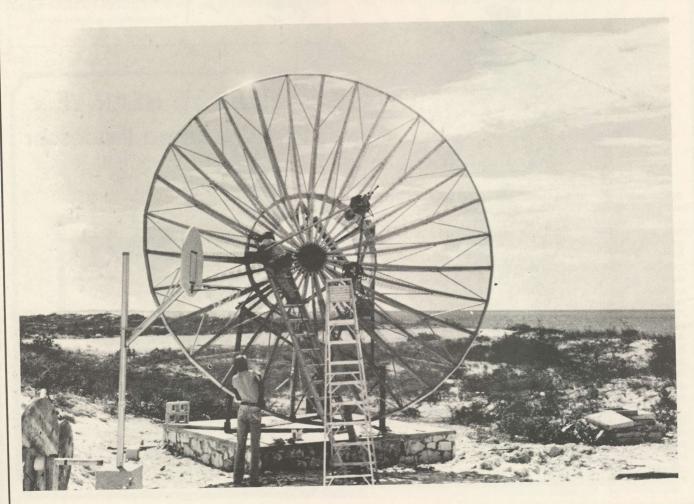
The next time we had a problem, it was a corker. Shortly after returning from Omaha I was running the big dish to Ghorizont to check on a Bulgarian dance festival that was due

up there around 10 AM in the morning. The dish was moving east and it faltered briefly (I cannot see it from the operating position, but the Satellite Seeker box tells me what it is doing), and then went on. After 30 seconds of going on I knew we should be approaching or be at Ghorizont. There was no sign of a signal, and I hadn't seen either of the Intelsat's as we passed by the 40-30-20 degree locations either. I instinctively let off on the manual "east movement" button and went to the window to gaze at the dish. It was pointed to around 90 degrees west rather than being in the 20 degree region. Obviously it had either stopped moving, or it had reversed rotation on me even though the control box was telling me to the contrary.

At the dish, we have a pair of manual control buttons. You can stand there and push either east or west. I went down and did this, pushing east. It moved west. Then I pushed west. It moved west some more. I had lost east, and worse yet, no matter what I did it wanted to go west. As I stood there pondering this, with both hands on my hips and nothing touching the manual control buttons, the dish sprang into life and started moving again. West. I yelled loudly to Kevin, thinking he may have gone into the WIV control room and was operating the control box. No response. The dish kept moving. As I watched in dis-belief it headed further and further west, and it suddenly occurred to me that if it didn't stop soon

it was going to cram the dish super structure into the frame. That was not going to do the parabolic curve any good!

Also at the dish we have mounted, for just such an emergency, a power control switch in a weatherproof box. Just inches before the "cram against the frame point", I finally woke up enough to remember that switch. I got it just in the



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P8-10/81



OP'S SATELLITE DIGEST-

nick of time. The dish glided, silently, to a stop only a 16th of an inch from the frame.

Once again my problem turned out to be "Proto-Type-Itis". The east-west controls are operated by reversing some windings inside of the 1/4 HP motor. Leads are brought out of the motor to a pair of 12 VDC operated relays. The relays, properly wired up, reverse the internal windings on the motor to reverse the motor drive direction. The motor operates from 110 VAC and it draws around 5 amps normal load and probably around 12 amps at initial start surge. The wiring of the 12 VDC operated delays, switching the 110 VAC for the motor around, had been done with some very light (#20) hook up wire. Drawing 5 to 12 amps through this type of light wire was plainly a mistake. Several wires had gotten hot and the insulation had burned off, shorting first two wires and then three wires together. The initial "west only" problem occurred when the first two wires heated up and became one. The "I have a mind of my own" problem occurred when the third one finally melted through to contact the other two.

All of this has been corrected in the present generation of Hero controls. Long before we reported the problem. But the lesson we learned will remain with us for a long time. A big dish borders on being a device of considerable destructive power when it has a motor drive. It can destroy itself, or it can do considerable harm to things around it. Even without getting loose from its mount!

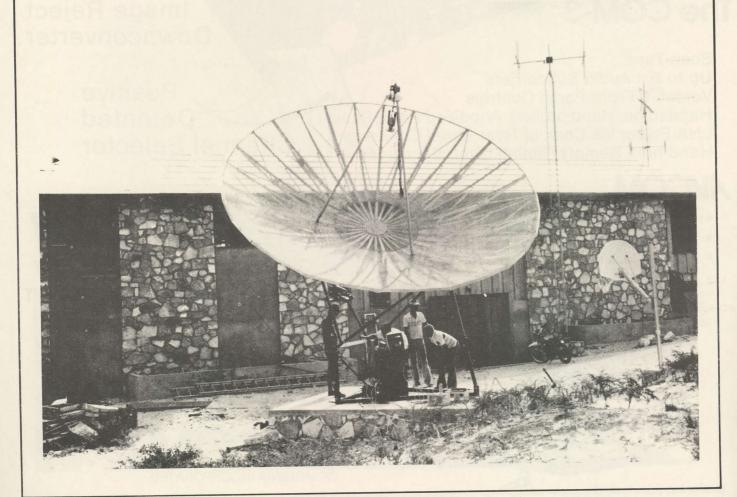
Now to performance. It was our hope that the 6 meter Hero would do as well as, or better than, the 5 meter AFC. The AFC five meter has been our mainstay antenna since we wrestled it out of the hold of an ocean freighter one year ago. It has a Speavy dual-mode feed and a pair of (very) carefully

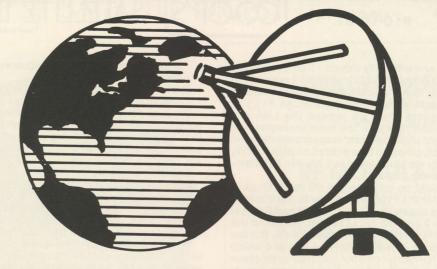
selected 85 degree Dexcel LNAs on it. We feed the LNAs with ½ inch hard line run directly to the N connectors (no flexible pigtails), until we get clear of the dish and then we connect to 7/8" hardline for the 100 foot run to the receivers. Living down here in the "fringe area", we leave nothing to chance.

The first LNA we put on the Hero 6 meter was a disappointment. It was a Dexcel, and an 85 at that. Bob Behar had hand picked it from a recent shipment because according to the spec sheet the "worst case" noise temperature was 78 degrees while the unit averaged 70-72 degrees over most of the band. This one looked, on paper, like a winner. After some disappointing CNR measurements we finally determined this particular (brand new) LNA was a bummer. It was not even a decent "150 degree" unit. Then we pulled a 100 degree unit off of the SatFinder dish and gave it a try. It took us another two hours to determine that this one, another Dexcel, was not even a decent 120. A 100 it was not. I have always been high on Dexcel LNAs, but after this two out of two experience my confidence was beginning to shake.

With nothing but some ho-hum 120s left about, we couldn't complete CNR checks of the 6 meter Hero before Bob returned to Miami, or the Coopers headed for Omaha. It was only after returning, and after repairing the run-away motor drive, that we finally got the opportunity to get a replacement Dexcel 85 degree unit (which checked out good) into operation. It made no sense to us to try comparing the 5 meter AFC dish with high quality 85 degree LNAs against a 6 meter antenna outfitted with anything less than an equivalent 85 degree LNA.

First we ran the 10 foot/3 meter SatFinder through the full North American domestic orbit belt, equipped with the same





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85 degree Dexel LNA and with a Washburn / Earth Terminals receiver. The metering on the Washburn makes it possible to do CNR measurements rather quickly. We selected a couple of transponders on each of the birds (D3 through F1), and make hard measurements. Then we **moved** the LNA and receiver **to the Hero** and repeated the measurements. We took this approach since any single bird measurements (such as F1) would not, we felt, give us a true indication of the ability of the Hero. The results we found were not, frankly, a pattern. At least not all of the way through.

In theory, there should be just about 5 dB more C (as in carrier) with the 6 meter than you will have with the 3 meter. We found this to be the case with D3, W3, W1, F2 and F1. That leaves D2 (D1), A-B, A-2 and W2 out of the list. We found the "added gain" on D2(D1), and W2 to be closer to 4 dB. But the real mystery proved to be Anik-B (A-B). Here is a bird which rides in the 3 to 4 dB CNR region on a ten foot SatFinder at our location and with a "5 dB added gain" 6 meter Hero, barely above 5 dB CNR. Clearly something is strange here.

Let's dispose of tracking error possibilities first. F1 is at the western end of the track. D3 is at the eastern end of the North American belt, with W3 close by. Both ends show proper "gain added". A-B is just about in the **middle** of our North American **portion** of the belt. Our first inclination was that the big 6 meter dish was having declination tracking problems; it was possibly not tracking **that** portion of the arc. Unfortunately, two facts set that possibility aside.

1)If the dish was experiencing tracking errors in a portion of the belt, some fine tuning on the nose (elevation) should bring it back onto the bird in question. We spent several hours on Anik B trying to improve things, but always ended back where the elevation was set for proper full arc tracking.

Brids close by (F2 in the case of A-B) should also show similar gain reductions. They do not.

We posed this "question to Taylor Howard" in Omaha since we had worked with the dish enough before leaving to know that Anik-B was not coming up like it should. Taylor is still thinking of a good explanation for our observations. So are we.

The only similarity we can see, amongst those birds that "refuse to come up", is that each has a boresight that is far removed from **our** location. The COMSTAR and W2 birds are well known for being "tight" with signal levels off of boresight. ANIK-B does not have **that** reputation, but it is certainly boresighted a long ways from the Turks and Caicos.

is there a clue there? We doubt it. But there is a message and it reminds us of similar problems some private installations have faced in extreme southern Florida. It has been known for several years that locations only a few miles apart in south Florida can be completely different in F1 performance; that a 10 footer at one location can outshine a 1.6 footer at another. Nobody has ever adequately explained this one to us. There seems to be something similar happening in our situation.

What is really perplexing is that the **anamoly** (fancy word for "**unexplained situation which does not meet the expected results**") defies several basic laws of physics. The foremost one being that satellite signals are merely RF signal voltage. And if an antenna of certain size and gain will capture so much of that signal voltage, a second antenna of additional size and gain **must** capture more of that signal voltage.





MAKE IT TRACK- Bob Behar "said" he came down to bring us the "Satellite Seeker" proto-type control box. He worked his fanny off in our hot Caribbean sun, and then spent the afternoon chasing up and down the beach on Tasha's three-wheel Yamaha and swimming with Kevin and I. He claims he saw a 10 foot Sting Ray off our beach. (They are harmless Bob; but scary as hell!)

Except down here!

Final Words On Hero 6 Meter

Would we put in another Hero six meter down here? That's

the bottom line, of course.

Having complete horizon to horizon motor control with an antenna that has the gain of the 6 meter is nothing short of being in satellite heaven. I'd like to have another one alright; but fear that if a second one made sense (I'm not sure it does right now), a third one might also make sense.

There is a very considerable market for big antennas that don't fall into the \$35,000 up price class tht he S-A 7 meter does. The Hero 6 meter, like its smaller 5 and 4 meter family members, is a good value. But there are these caveats:

1) Any antenna this big needs a visual and fail-safe system built in, that tells the operator when he is approaching either end of the rotating swing. I'm putting one on ours, and backing that up with a dedicated cheapy black and white TV camera trained on the dish at all times. I don't want some semi-trained WIV employee running the dish into the frame. Ever.

2) Any dish this big, that comes in erector set form, must be proofed on site or you will never realize the antenna's true gain. Proofing means having a template, from the manufacturer, which allows you to adjust each support strut

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precisely to the parabolic curve. Lacking that, you'll end up with a six meter surface and possibly 4 meter performance. Why bother to put in a big antenna if you are not going to get maximum gain out of it!

3) No antenna this big should be undertaken, as a project, by somebody in a hurry. Not the first time, anyhow. You will do several things wrong, no matter how good the instructions may be. And if you try to push too fast, you'll not catch your mistakes until it may be too late to correct

them without major surgery.

I salute Bob Behar for having his dedication to making a big antenna work, and to provide high value to the user. I know Bob well enough to know that he is constantly evaluating better ways to make his products work and I expect his full Hero line to be in a constant state of improvement and refinement in the years ahead. That doesn't bother me at all; it would bother me far more if he chose to freeze the design at some stage. The Bob Behars of this industry are what we have going for us!

CONTEST/CONTEST

A SUPER WEEKEND

At the recently completed SPTS '81 in Omaha, Bob Cooper discussed with several manufacturers of satellite hardware the concept of holding a weekend long "Satellite Enthusiasts Contest". The idea is that if you are given a set of rules to follow, and a time during which others like you will be following the same rules, you could spend a weekend concentrating on seeing just how many different satellite signals

you could "log" and "identify" One of the on-going problems with the rapid growth of the programming and relay end of the business is that dozens of new service users (literally) are showing up every week. Many of these are audio or data rather than video, but they are new to the satellite service none the less. Keeping up with what is available, when and where (i.e. what time and on what transponder) is more than a fulltime job; it borders on being an almost impossible task. So we conceived the idea of setting aside a special weekend during which everyone who wants to tackle a fun project could individually set out to see how many different satellite signal types he or she might tune into, and identify. Each participant would compete against others in his or her general "class". That is, people with fixed antennas that cannot be moved to another satellite (except with great effort), would be in one class of participants. This class would be free to select the bird they wished to zero in on, for the contest weekend, but they would have to stay with that bird for the full weekend. A second class would be made up of people who have moveable dishes which are not motorized. This class of entrants will be free to move their dish from bird to bird during the contest period, but they have



OP'S SATELLITE DIGEST P13-10/81

to be people who are forced to go through a manual (i.e. outdoor) moving exercise with their dishes. The third class would be for those elitists who have motorized dish arrays. In theory, they can move from bird to bird at the touch of a button and that would give them an advantage over those who do not have such equipment.

Now we felt that there should be some incentives for participating in such an event, and for being the "best" in your class. Each participant will use official contest logging forms which CSD will supply, and each "logging" will tell us, when we receive your completed forms, what you saw or heard, when and where. From the mountains of data we expect to receive on these logging forms, we will prepare the most thorough "Satellite Services Reference Book" ever assembled. In effect, each contest participant will become a "reporter" for the SSRB and it will be a joint, worldwide effort. Naturally if this works reasonably well, we would like to repeat it at least once per year, thereby updating the basic data available and benefiting each of us by giving us a reference book that is current, or nearly so.

So we went to a few of the manufacturers and asked them if they would be willing to donate equipment as prizes. Just so you will know up front, for the "donation" of equipment a supplier in return will receive advertising space in CSD (we are in effect "buying the prize equipment" with advertising space), and, in the "Satellite Services Reference Book". Most contests don't let you in on such secrets; we feel since this is a small industry with no room for secrets, we wanted you to be

aware of this "arrangement".

To our overwhelming surprise, each of the suppliers we discussed this with at Omaha said that "yes", they wanted to donate prizes. We have three TVRO receivers already pledged as prizes, as well as a couple of satellite antenna systems and even a 6 foot big-screen big-name-brand projection television receiver (valued at \$4,000). In short, we have a start on prizes which is almost unreal!

The prizes will be awarded for the top winners in each of five categories. One of the categories is capable of being redundant with winning in another category so we are setting that one straight up front as well. Here is how this will work:

1) Grand Prize - fixed dish. We have already defined what a fixed dish entrant is; we'll have a prize in at least the TVRO receiver/antenna category for the big winner here.

2) Grand Prize - manual dish. Again, we've defined what this entrant has for an antenna. And again, we'll be giving away at least a full TVRO receiver or antenna for the winner here.

3) Grand Prize - automated dish. Once again, a minimum of a new TVRO receiver or dish antenna here.

4) Grand Prize - non-USA. This category is open to anyone who lives outside of the U.S. (48 continental states), Canada, Mexico, Bahamas, Grand Cayman, Turks & Caicos, Hispanola, Bermuda, Puerto Rico or US Virgin Islands): Again, at least a TVRO receiver or equivalent as a prize.

5) Grand Prize - sprint. During the contest there will be a designated three hour period. The three hour period will apply to everyone, regardless of where they are. In that three hour period the object will be to see how many different satellite services you can "log" (i.e. see or hear) in a rush or "sprint" condition. With time working against you, and with every other entrant also working in the same 3 hour period "sprint", it will be the peak activity period. The entrant that accumulates the maximum number of "points" in that period will win the projection TV set!

Now the official rules will not be released (here in CSD) until we have established the weekend during which the contest will be held. Our first thought was to schedule the contest over the period just after the F1 to F3R switchover. However, after carefully considering what that really means, we decided to wait a bit longer than that. This says that the contest period will probably be in late January or February (yes, we know this makes it tough on people who have to manually crank antennas in the north!). Even though the "rules" will not

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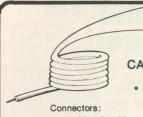
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be released for a short period yet, here are some things you cannot do.

- 1) Multiple antennas sorry, only one satellite antenna per entrant.
- 2) Multiple receivers sorry, only one satellite receiver (to be used) per entrant.

3) Multiple "operators" - sorry again, this is a contest pitting individuals against individuals. Even those who have manually adjustable antennas are going to have to certify that they "did it alone", or, suffer a "point penalty" for having to enlist assistance with their dish moving exer-

There are two general categories of signal - services on the bird. There are video signals, and, narrow band (audio, data) signals. There are far more of the latter than the former, and the non-video signals are often difficult to identify. If you do not have a copy of "Coop's Satellite Operations Manual", which discusses reception of non-video signals, we suggest you order one promptly. Why? Well, because the winners (we predict) will make good use of the non-video signal sources in their weekend of signal logging. The video signals will count more "points" than the audio signals, but, when you consider that there may be as many as 1,200 different audio or narrow band signals on a single transponder...well, it becomes clear that anyone who is serious will want to be capable of tuning in the non-video signals. Strategy? Well, there are several things that the smart

"planner" might do. We'll discuss our thoughts on some of these concepts next month. In the meantime, start thinking about sending the wife and kids downstairs to enjoy terrestrial TV for one weekend this winter, while you concentrate on logging every signal you can find on the bird or birds of your choice. Oh yes, one of the entrance requirements will be that you submit a photo of you standing next to your dish antenna. While the weather is still bright and clear, we suggest you get that photo taken and tucked away for safe keeping!

> SVS '81 AN EXPERIMENT

LIVE AND IN COLOR

The forthcoming Satellite Video Show scheduled for November 20/21/22 in Anaheim, California will attempt to draw heavily from the southern California area. The emphasis will be on the "marriage" or inter-action going on between the home satellite or private terminal system, and, the explosive growth in big screen projection systems and associated home-video apparatus.

One way to demonstrate that "marriage' is to build the Show around video as a communications medium. The exhibit hall for the host hotel (Anaheim's brand-new Marriott)



SATELLITE DIGEST

P15-10/81

will be "open" for extended hours, all three days. This is being done to handle what is expected to be a very large crowd of both dealer and retail buyers from the California marketplace. The traditional seminars, usually conducted when the exhibit hall area is closed down, will be held simultaneously to the exhibit hall hours.

The seminar sessions meeting hall is relatively small; but to make the seminar sessions available to attendees **all sessions will be televised**, live, and sent through the Marriott MATV system. And here is the added "wrinkle".

At approximately five locations through the exhibit hall, "Satellite Viewing Islands" will be established. Large screen TV screens will be set up throughout the exhibit hall, with seating at each location. In this way an attendee can **stay** on the exhibit hall floor, and take in the seminar sessions! Of course by sending the live sessions throughout the MATV system as well, those who want to escape the crowds can retire to their rooms for sessions and still not miss any of the seminar sessions. If you have the ability to bring your own VCR, you will be able to tape (live) the sessions as they occur. This promises to be a big plus for those attendees who want an "early generation copy" of sessions, without the usual tape dub sacrifices in quality.

Now in addition to the live system coverage of the sessions, we will also be using the same MATV system channel to send along to you (whether in your room or in a viewing island location on the exhibit hall floor) an additional 20 hours or so of special "all about satellite TV techniques" programming, from past SPTS/SBOC events.

In anticipation of a large crowd, spread over the three days of exhibits, the "attendance fee" has been dropped to \$90 (pre-registration rate). Past SPTS events have been \$150 each. With the deployment of F3R expected this month (October 16th is the tentative launch date), and Satcom F4 to follow before the end of the year, the rapid growth in satellite video services is once again starting. Early in 1982, Westar 4 will go into orbit, to be followed at 4-6 month intervals by new video satellites through at least 1985.

Past exhibitors at SPTS '81 Omaha and other recent SPTS events have already been notified of the opportunity to contract for exhibit space at SVS '81. If you are new to the industry and interested in being an exhibitor at Anaheim, you are advised to contact Rick Schneringer at STTI, P. O. Box G, Arcadia, Oklahoma 73007 (405-396-2574). Exhibit space is limited.

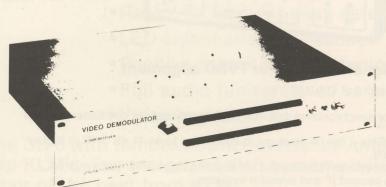
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MODEL V-100CR RECEIVER

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- Inboard Modulator Standard
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- Built-In LNA Power Feed

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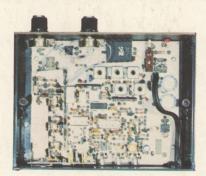
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SPECIFICATIONS

Frequency range: 3.6-4.3 GHZ tunable Audio range: 5.2-7.6 MHZ tunable Threshold: 8db CNR IF bandwidth: 30 MHz for full fidelity video LNA power: 15 volts regulated for up to 2 LNAs Standard one volt audio and video, **Outputs:** compatible with VCRs, monitors and modulators BC-1 RF modulator kit, tunable channels Optional: 3-6 with sound



div. Ramsey Electronics, Inc., 2575 Baird Rd., Penfield, NY 14526, 716-586-3950